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## A SURVEY OF RETARDED SCHOOL CHILDREN

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The purpose of this paper is to describe the methods employed and the results obtained in a survey of retarded school children. This survey was recently made in a small town of northern Minnesota. The town is on the iron range, a fact which determines to a large extent the character of the school children. A large proportion of the retarded children were foreign-born. The population of the town is between 7,000 and 8,000, and the total school population about 2,000. Because of the wealth derived from the mines the funds available for school purposes are abundant. The buildings are well constructed, well equipped, and well manned. As a whole the system represents the most intelligent school guidance which is possible in a community of that size. From the point of view of the school authorities, the motive which led to the survey was the law, recently passed in the state of Minnesota, by the terms of which \$100.00 per year is paid by the state for the training of each subnormal child in a school district. The supervisors and teachers of the grades were aware of the fact that many retarded children were present in the kindergarten and throughout the grades. To remove the burden of the retarded children from the grade teachers, they, therefore, welcomed an examination of all retarded cases. If in the report which follows the characteristics of the individual case seem to be overemphasized, it must be borne in mind that the causes of retardation are always causes which operate in some particular individual. In order to ascertain what these causes are, each case must be studied as a problem which is entirely unique.

In carrying out the survey the author of this article was assisted by the two supervisors of the grades, the school physician, and the school nurse, as well as by the administrative co-operation of the superintendent. Two rooms were set aside in one of the buildings,

one for the physical examinations and the other for the mental tests. The various steps involved in carrying out the survey may be enumerated as follows:

1. A preliminary study of the amount of retardation by means of a grade and progress study-card. This work was carried out by the supervisors.
2. An information blank, a copy of which is here published, which was filled out by the school physician and school nurse.
3. A physical examination, the details of which will be given below.
4. Mental tests to determine the mental level of the children.
5. Analysis of special difficulties. A psychological analysis of the child's capacities and attainments with view to prescribing educational treatment is necessary. It was not possible, in the limited time devoted to this survey, to make this individual study of the special difficulties of each retarded pupil. The intelligent and successful handling of the children in the subnormal classroom requires that such an analysis be made.

The grade and progress study-card was that published by the Department of Public Instruction of the state of New Jersey. A copy of this card is here printed, with the results of our survey:

#### GRADE AND PROGRESS STUDY-CARD

*To the teacher.*—The object of this card is to gather data pertaining to your pupils' school progress. Record in the proper spaces the number of your pupils in Grade 1 who have been in school 1 year, 2 years, etc., the number in Grade 2 who have been in school 1 year, 2 years, 3 years, etc. Begin the record of the years in school with the child's first entrance into a first grade of any public or private school, not including kindergartens. Count as a year's attendance any time exceeding one-half of a school year, disregarding any period less than one-half year. The memory of your pupils will in general be reliable in determining length of time they have been in school, in those cases concerning which you have no record or personal knowledge.

*To the teacher.*—The numbers appearing at the right of the heavy zig-zag line represent those who are three years and more retarded. Enter all these in the lower left-hand schedule by grades, grouping them into classes according to "Suggestions" pamphlet, pp. 8 to 12. Indicate in the lower right-hand schedule the number of pupils at the left of the heavy zig-zag line who should be classed in the special classes A, B, C, but who are not three years retarded.

The instructions to the teacher are explicit and need not be repeated. The classification of the pupils who are three years or more retarded requires some elucidation. Class A is called miscellaneous.

This class of retarded children consists of (1) foreign-born children, who do not know the English language; the needs of these may best be met by putting them by themselves in schools of approximately 20 or 25 children to a teacher; the school may be ungraded and the requirements for promotion should be liberal and elastic, taking into account ability rather than graded courses of study; (2) children who have entered school late, or who have been irregular in attendance; the needs of these are met in the same way that the needs of the foreign-born children are met, or by the help of a special teacher who can clear up for each one the special difficulties that retard; such a special teacher would receive children from various rooms for short periods each day; this plan is adaptable to places where only a small room is available; (3) physical defectives; these children are sometimes mentally subnormal, but not always so. Their difficulty may be one of defective eyes, ears, vocal organs, or of adenoids and enlarged tonsils. Medical inspection should reveal the seat of the difficulty with these children, and the inspection should result in effective measures for the removal or neutralizing of the difficulty.<sup>1</sup>

Children of Class B are called Incurrigibles.

This class of retarded children is made up of the habitually lawless. They are those whose influence is harmful to the moral health of the school. Under the laws, the only way to deal with these children is to remove them to a special school, where a course of instruction modified to meet their interests, and methods of control suited to their needs, may be established. Such a course of study should strongly emphasize manual-training activities.<sup>1</sup>

Class C consists of the mentally subnormal.

It will be seen from the results obtained by the preliminary survey that the total number of pupils in the grades is 1,537. The number of children three years or more retarded is 17. The classification suggested by the supervisors is indicated in the appropriate place on the card. This classification, however, was not followed in the segregation of the retarded pupils in the subnormal classroom.

Information with regard to family histories and the development of the children is difficult to obtain from many of the foreign population, but since it is necessary to make a medical diagnosis

<sup>1</sup> State of New Jersey Department of Public Instruction, *The Treatment of Subnormal Children*, Trenton, 1912.

Grades	Years in School												Total	Three Years and More Retarded	Percentage of Pupils Three Years and More Retarded
	1	2	3	4	5	6	7	8	9	10	11	12			
	I.....	231	38	1											
II.....		164	63	3									230		
III.....			138	75		2							242	2	
IV.....			2	137	7	18	7						341	7	
V.....				2	107	68	20	2	1				200	3	
VI.....					1	89	33	16	3				142	3	
VII.....					1	8	65	36	9	1	1		121	2	
VIII...							4	47	30	10			91		
Total..													1,537	17	

CLASSIFICATION OF PUPILS THREE YEARS OR MORE RETARDED													ADDITIONAL PUPILS BELONGING IN THE SPECIAL CLASSES, BUT NOT THREE YEARS RETARDED				
Class	Grades								Grades								
	I	II	III	IV	V	VI	VII	VIII	I	II	III	IV	V	VI	VII	VIII	
A.....			1	5	2	2	1		22	24	54	31	36	12	13	11	
B.....					1	1				1		4			1		
C.....			1	2			1		13	5	3	1	2	3			

of each pupil as well as a mental diagnosis the value of this information is very great. The form which was used in this work is shown in Schedule I.

#### SCHEDULE I

Source of Information.....	Date.....
Name.....	
Address.....	
Age.....	Sex..... Nationality.....
Home condition.....	
Present complaint.....	
Age of parents at time of birth of child. Father..... Mother.....	
Serial account of children and miscarriages.....	
Developmental history of child:	
Birth, full term... Premature... Months... Normal... Instrumental.....	
Breast-fed..... Artificial..... What food?.....	
First tooth..... Walked..... Talked.....	
Diseases of childhood.....	
.....	
School history, when started.....	
Progress.....	
Diagnosis.....	
Treatment.....	

In inquiring about the diseases of childhood, especial attention should be paid to the occurrence of convulsions and fits. While it is true that not all infantile convulsions indicate permanent brain-trouble, it is frequently the case with children who have fits as infants and later become mentally defective.

The physical examination can properly be made only by a physician with the assistance of a nurse. It is necessary for the child to disrobe completely. There should be a suitable examining table, with clean sheets and blankets for covering the pupil. The inspection of the body for evidences of pathological conditions should be preceded by careful anthropometric measurements. These measurements include the weight, heights, sitting and standing, vital capacity as measured by a spirometer, and strength of grip of right and left hand. The nurse should take the temperature by mouth, and record pulse and respiration. The body of the pupil should then be carefully inspected from the crown of the head to the soles of the feet. It is exceedingly rare that such an examination does not reveal some remedial pathological condition. In the hair and scalp *pediculosis capitis* is a common cause of trouble, especially when the hygienic conditions of the home are

poor. These vermin are sources of irritation to the child, and lead to secondary infections which may become serious. The ears should be tested for their auditory acuity and for the presence of wax in the external auditory meatus. The eyes are the seat of various troubles which manifest themselves in the reflexes of the pupils, in latent strabismus as well as in refractive errors. This latter condition, however, is relatively easy to detect and equally easy to correct. It is significant that Ayres, in *The Laggards in Our Schools*, found no correlation between defective eyesight and retardation. Disturbances in motility, such as nystagmus and strabismus, may cause serious difficulty. The nose should be inspected with reference to obstructions in the nasal passages and for the presence of adenoids. The mouth is the seat of many pathological conditions. Inflamed gums (interstitial gingivitis) which result in chronic pus infections of the gums, pyorrhea alveolaris, are extremely common in the defective children who make up so large a part of the retarded school children. Decayed teeth are exceedingly common. The recommendation of the inspector should mention the care of defective teeth by a dentist. The tongue by its motility, by the presence of tremor or deviation, indicates the integrity or disease of certain parts of the nervous system. The throat, as the seat of inflamed or enlarged tonsils, is frequently a source of many physical ailments. The principal of these ailments are infections of the heart, chronic tonsillitis, middle-ear catarrh, and chorea, or St. Vitus' dance. The presence of adenoids can be determined by the mouth breathing and by palpation with the finger. The injurious effects of these structures upon the growth and mental development of the child have been amply demonstrated. Inasmuch, however, as they are exceedingly common in childhood, they may serve to mask a more fundamental cause of retardation. The examiner should never rest satisfied with the discovery of adenoids. The thyroid gland is one of the important ductless glands of the body and should be observed with respect to its enlargement or complete absence. It is well known that cretinism results from the congenital absence of this gland. In the neglected children who constitute so large a part of the retarded school children the gland is frequently enlarged. This is due, in most cases, to infection from the tonsils

and throat. In the chest, the heart and lungs should be carefully examined. Leaky heart valves are exceedingly common in young children, though their presence is often not suspected. A defective heart may exert a very important influence on the growth and development of the child. The lungs, and especially the apices, as the seats of early tuberculosis, should be subjected to careful examination. The abdomen does not often present important pathological changes in retarded school children. Hernias of the umbilical and inguinal regions are to be sought. The enlargement of the inguinal glands are of diagnostic significance in certain conditions. The glands in the arm above the elbow, in the armpits, and in the neck, may give early signs of tuberculosis or syphilis. In the external genitals of the child important causes of retardation may be found. In the male the undescended testicle may cause serious interference with the sexual development of the boy. Various malformations of the prepuce, the chief of which are phimosis or partial phimosis and an abnormally long prepuce, are common. In all cases of this sort circumcision should be recommended. A lax scrotum usually signifies masturbation. The condition of the nervous system is indicated by the reflexes. The chief of these, in addition to those mentioned in connection with the eyes are the pharyngeal, biceps, triceps, umbilical, the cremasteric in the male, the patellar, and the plantar. The sensory capacity of the skin should be tested for the presence of anesthetics. The pain sense, the tactile sense, and the temperature sense may be separately affected. Any marked change in any of these sense departments is indicative of serious nerve-trouble. The co-ordination of the body, especially in the use of the arms and legs and the Romberg sign, should be tested. The posture of the body, the lateral curvature of the spine and kyphosis should be noted. A Wassermann test should be made in all cases on the blood serum. Recent serological studies of the blood serum in feeble-minded children shows that fully 20 per cent are infected with syphilis.

In the survey upon which this report is based, two tests of general mental level were made, namely, the Goddard revision of the Binet-Simon test, and the Yerkes point scale. In the opinion of the author the point-scale method is destined to supercede the Binet-Simon test. In general the results obtained by the two tests



run closely parallel to one another. There was a tendency to diverge at the lower and upper ends of the scale. The findings in a few of the cases are given in detailed form for purposes of illustration; a summary of the recommendations in each case examined is also given.

S. D. Age, 12; Binet-Simon age,  $9\frac{1}{5}$ ; point-scale age, 8+.

*Measurements.*—Weight, 35.5 kg.; height standing, 146.6 cm.; height sitting, 79.2 cm.; spirometer, 70.6 cubic inches.

*Physical examination, made by Dr. Stevens.*—Head: there are nystagmoid movements of the eyes; there is pyorrhea alveolaris; there are several carious teeth; the tonsils are enlarged on both sides. Chest: there is marked enlargement of the thyroid gland; the heart is negative; there is bronchial breathing in the apices of both lungs. Abdomen: the abdomen is negative. Glands: the epitroclear gland is enlarged on the left side. Reflexes: the reflexes are negative. Skin: there is *pediculosis capitis*. Co-ordination: the Romberg sign is positive.

*Recommendations.*—This girl should be placed in the subnormal classroom. She is retarded four years mentally. The tonsils should be removed immediately, as they are probably the source of the enlarged thyroid gland. The teeth should be treated by a dentist. It is probable that the hyperthyroidism due to the enlarged gland is responsible for the incorrigibility of this child. The removal of the tonsils should tend to correct this condition.

D. J. Age, 15; Binet-Simon age,  $8\frac{2}{5}$ ; point-scale age, 10.

*Measurements.*—Weight, 48.7 kg.; height standing, 149.2 cm.; height sitting, 80.4 cm.; spirometer, 160 cubic inches; grip, right, 60; left, 60.

*Physical examination.*—Head: the eyes are negative; there are several carious teeth; the tonsils are enlarged; the nose is negative. Chest: the heart and lungs are negative. Abdomen: the abdomen is negative. Genitalia: there is a phimosis. Glands: the axillary glands are palpable. Reflexes: the reflexes are negative. Co-ordination: the co-ordination is good. The Romberg sign is negative. Skin: there is a scar on the right side below the twelfth rib.

*Recommendations.*—The phimosis requires circumcision. The carious teeth should be cared for by a dentist. The mental tests indicate that this boy is five years retarded. He should be placed in a subnormal classroom, and his educational training should consist largely of industrial training, such as manual training, with view to training him in some trade which would make him self-supporting. Since he has not profited by the ordinary school work and in view of his age, I believe it is desirable to lay the emphasis for his future education on manual training.

E. J. Age, 10; Binet-Simon age,  $5\frac{1}{5}$ ; point-scale age, 4+.

*Measurements.*—Weight, 20.9 kg.; height standing, 116.4 cm.; height sitting, 58.75 cm.; grip, right, 20; left, 18.

*Physical examination, made by the school physician.*—Head: there are several carious teeth; the tongue deviates to the right; the eyes are negative. Chest: there is a slight enlargement of the thyroid gland; there is arrhythmia of the heart; the lungs are negative. Abdomen: the abdomen is negative. Reflexes: the reflexes are negative. Glands: the glands are negative. Skin: there is a macular rash on the chest and forearms; there is *pediculosis capitis* (alive).

*Recommendations.*—This girl is five years retarded mentally. She should be placed in the subnormal classroom. It is unlikely that this degree of retardation comes from any environmental cause. Her condition is probably not greatly improvable. She should, however, be given a chance for at least a year in the special classroom. If at the end of that time she should fail to make sufficient progress, she should be sent to the state institution at Faribault. In view of the fact that she has a sister whose condition is similar to her own, a Wassermann test on the blood serum of both would be advisable.

R. L. Age, 12; Binet-Simon age,  $7\frac{2}{3}$ ; point-scale age, 7+.

*Measurements.*—Weight, 29.7 kg.; height standing, 132 cm.; height sitting, 69 cm.; spirometer, 90 cubic inches; grip, right, 38; left, 40.

*Physical examination, made by the school physician.*—Head: The teeth are broken and uneven; the tongue is coated; the eyes are negative. Chest: the heart and lungs are negative; there is a slight enlargement of the thyroid gland. Abdomen: the abdomen is negative. Genitalia: there is a long prepuce. Glands: the glands are negative. Skin: the skin is negative. Coordination: the co-ordination is poor.

*Recommendations.*—This boy is over four years retarded mentally. His technical rating is high-grade imbecile. Inasmuch as he is handicapped by the foreign language of his parents, he should be given special educational opportunities in a subnormal classroom, in which a large part of his work should be in the nature of manual training. Efforts should be made to train him in a trade. If, after a trial of one year, there is no considerable improvement it would be advisable to have him sent to the state institution for the feeble-minded.

F. O. Age, 7.

Boy did not speak; mental tests were therefore impossible. When asked "Do you want some candy?" he shook his head. He stands up when told to do so. Puts hands in pockets when told to do so. Shows and folds hands when told to do so. His vocabulary has probably been limited to a dozen words.

*Measurements.*—Height standing, 114.8 cm.; height sitting, 61.6 cm.

*Physical examination, made by Dr. Stevens.*—Head: there is some asymmetry of the head; the right frontal region is flatter than the left; he drules continually; the eyes are negative; there are several carious teeth; there is pyorrhea alveolaris; the right tonsil is considerably enlarged. Chest: he is pigeon-breasted; the thyroid gland is enlarged on the right side; the heart

and lungs are negative. Abdomen: the abdomen is negative. Genitalia: there is a phimosis. Reflexes: the reflexes are negative. Glands: both epitroclear glands are enlarged. Skin: there are scars in the gluteal region on both sides. (Note: There are enlargements at the distal extremities of the radius.)

*Recommendations.*—This boy is an imbecile. He should be sent to the state school at Faribault. He has suffered from rickets, which perhaps accounts for his mental condition. Tonsillectomy and circumcision should be made.

T. R. Age, 11; Binet-Simon age,  $6\frac{4}{5}$ ; point-scale age, 6+.

*Measurements.*—Weight, 36.9 kg.; height standing, 138.5 cm.; height sitting, 7.6 cm.; spirometer, 130 cubic inches.

*Physical examination, made by Dr. Stevens.*—Head: there is nystagmus of the eyes; the tonsils are markedly enlarged on both sides; the child is a mouth-breather. Chest: there is slight enlargement of the right lobe of the thyroid gland; the heart is negative; there are rales in the upper lobe of the left lung. Abdomen: there is some tenderness over McBurney's point and over the sigmoid. Genitalia: there is a partial phimosis; the right testis is not in the scrotum. Reflexes: the reflexes are negative except for the fact that the cremasteric reflex is absent on the right side. Co-ordination: there is a marked tremor of the eyelids; the Romberg sign is positive. Skin: there is a seborrheic dermatitis.

*Recommendations.*—This boy should be placed in a subnormal classroom. His case requires special educational training. There are several physical defects mentioned above, which should be corrected. The tonsils and adenoids should be removed. The right testis should be brought down into the scrotum. Correction of these physical defects may have an important influence on his future development.

C. R. Age, 8; Binet-Simon age,  $7\frac{2}{5}$ ; point-scale age, 7.

*Measurements.*—Weight, 34.6 kg.; height standing, 129.5 cm.; height sitting, 68.2 cm.; spirometer, 86 cubic inches; grip, right, 42; left, 31.

*Physical examination, made by Dr. Stevens.*—Head: The eyes are negative; there are three carious teeth; the right tonsil is considerably enlarged. Chest: there is a deformity of the chest, known as Harrison's groove; the heart is negative; there are pathological sounds, known as rales, in the apex of the right lung. Abdomen: the abdomen is negative. Genitalia: there is a partial phimosis. Glands: the axillary glands on the right side are enlarged and hard; the anterior cervical glands on the left side are enlarged. Reflexes: the reflexes are negative. Co-ordination: there is a twitching of the facial nerves on the left side.

*Recommendations.*—This boy is not sufficiently retarded to be placed in a subnormal classroom. His mentality is such that he should be able to do first-grade work easily. His physical condition is defective in several particulars. The tonsils should be removed and the carious teeth should be filled.

The partial phimosis calls for circumcision. The enlargement of the glands in the right armpit and the rales of the right lung are suggestive of tuberculosis. He should be carefully watched and, if possible, an X-ray picture should be made of his chest. This boy requires careful medical attention.

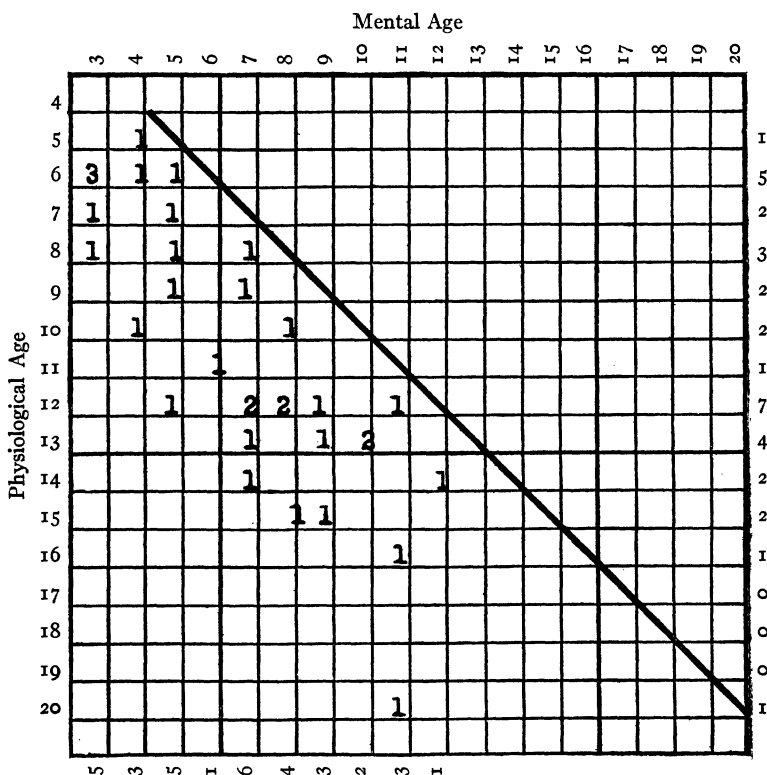


CHART 1.—Showing the correlation between the physiological and mental ages of thirty-three school children.

The correlation between the physiological and mental ages of the group of thirty-three children is shown in the accompanying table. The heavy diagonal line is drawn at the intersections of the lines representing the physiological and mental ages. The degree of retardation in each case is shown by the distance between the diagonal line and any particular case. The numbers at the right of the chart show the physiological ages of the group, while

the numbers at the bottom of the chart show the mental ages of the group. The figures in the chart indicate the number of children, with corresponding physiological and mental ages.

Inasmuch as it is impossible to publish the detailed findings in each case, a summary of the recommendations and the mental ages of all the children examined is given in the following table:

Case	Age	Mental Age	Recommendations
L. A. ....	13	10	Removal of adenoids. Special work in present grade
A. B. ....	8	5+	Subnormal classroom. Removal of adenoids
H. C. ....	6	5	Speech training in first grade
E. C. ....	12	9	Operation for undescended testicle
M. C. ....	6	Imbecile	State School for Feeble-minded at Faribault
B. C. ....	6	3	Removal of adenoids. Subnormal classroom
J. C. ....	12	11	Wassermann test. Work in fifth grade
M. C. ....	13	9+	Wassermann test. Antisyphilitic treatment. Subnormal classroom
M. D. ....	14	12	Continuation of present grade with social methods of stimulating his interest
M. D. ....	16	11	Special work in domestic science
J. D. ....	8	Imbecile	State School for Feeble-minded at Faribault
S. D. ....	12	8+	Subnormal classroom. Removal of adenoids
E. E. ....	12	8	Operation for undescended testicle. Subnormal classroom
A. F. ....	15	8	Subnormal classroom. Domestic science
R. J. ....	15	9	Circumcision. Subnormal classroom
E. J. ....	10	4+	Subnormal classroom
J. J. ....	12	5	Subnormal classroom
S. K. ....	14	7+	Subnormal classroom. Domestic science
R. K. ....	6	Imbecile	Circumcision. Tonsillectomy. State School for Feeble-minded at Faribault
R. L. ....	12	7	Subnormal classroom
R. L. ....	10	8	Present grade
E. M. ....	12	7	Subnormal classroom
C. M. ....	5½	4+	Treatment for chorea. Continuation in present grade
T. O. ....	13	10+	Removal of adenoids. Circumcision. Continuation in present grade
F. O. ....	7	Imbecile	State School for Feeble-minded at Faribault
M. P. ....	7	5+	Subnormal classroom. Tonsillectomy
R. P. ....	9	5+	Subnormal classroom. Nutrition should be improved
T. R. ....	11	6+	Subnormal classroom. Operation for undescended testis
M. R. ....	6	4+	Correction of strabismus. Special speech training. Continuation in present grade
C. R. ....	8	7	Continuation in first grade work. Tonsillectomy and circumcision. Continued observation for tuberculosis
P. S. ....	13	7	Subnormal classroom. Manual training
A. T. ....	9	7	Subnormal classroom
E. V. ....	20	11	Manual training